

Exhibit C



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/963,749	07/21/2020	Thomas Lippert	29959/55804	6322
4743	7590	04/22/2022	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP			KIM, SISLEY NAHYUN	
233 SOUTH WACKER DRIVE			ART UNIT	
6300 WILLIS TOWER			PAPER NUMBER	
CHICAGO, IL 60606-6357			2196	
			NOTIFICATION DATE	
			DELIVERY MODE	
			04/22/2022	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mgbdoCKET@marshallip.com

Application No.

16/963,749

Applicant(s)

Lippert et al.

Office Action Summary

Examiner

SISLEY N KIM

Art Unit

2196

AIA (FITF) Status

Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 07/21/2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-10 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-10 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

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Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

CLAIM INTERPRETATION

2. The following is a quotation of 35 U.S.C. 112(f):

(f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

3. The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

4. This application includes one or more claim limitations that do not use the word “means,” but are nonetheless being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, because the claim limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are: “a plurality of computation nodes, a plurality of booster nodes, communication interface, resource manager, and application manager” in claim 9.

Because this/these claim limitation(s) is/are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are being interpreted to cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

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If applicant does not intend to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph (e.g., by reciting sufficient structure to perform the claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph.

Claim Rejections - 35 USC § 102

5. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

7. **Claims 1-10** are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Lippert et al. (US 2013/0282787, hereinafter Lippert).

Regarding claim 1, Lippert discloses

A method of operating a heterogeneous computing system comprising a plurality of computation nodes and a plurality of booster nodes, at least one of

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the plurality of computation nodes and plurality of booster nodes (Fig. 2, paragraph [0067]: FIG. 2 shows a computer cluster arrangement comprising a cluster C as well as a booster group BG. The cluster comprises in the present embodiment four computation nodes, also referred as CN, as well as three boosters, also referred to as B) **being arranged to compute a computation task, the computation task comprising a plurality of sub-tasks, wherein in a first computing iteration, the plurality of sub-tasks are assigned to and processed by ones of the plurality of computation nodes and booster nodes in a first distribution** (paragraph [0091]: In a first step 100 at least the first part of a computation task is computed by at least two of the plurality of computation nodes CN, each computation node CN interfacing a communication infrastructure IN. Furthermore, computing of at least a second part of the computation task in step 101 by at least one booster B is performed, each booster B interfacing the communication infrastructure IN); **and**

information relating to the processing of the plurality of sub-tasks by the plurality of computation nodes and booster nodes is used to generate a further distribution of the sub- tasks between the computation nodes and booster node for processing thereby in a further computing iteration (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least

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a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

Regarding claim 2, Lippert discloses

wherein an application manager receives the information and determines the further distribution (paragraph [0097]: For doing so the resource manager RM may access the assignment metric, which may be stored in a database DB or any kind of data source. The resource manager RM is arranged to update the assignment metric, which can be performed under usage of a database management system. The database DB can be implemented as any kind of storage. It may for instance be implemented as a table, a register or a cache).

Regarding claim 3, Lippert discloses

wherein a resource manager (paragraph [0097]: the resource manager RM is arranged to evaluate the resource capacities of the booster B and performs the assignment, which means the selection of the booster B, as a function of the evaluated resource capacities of each of the boosters B) **determines the assignment of tasks and sub-tasks to the computation nodes and booster nodes for the first iteration**

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as a function of the computation task (paragraph [0091]: In a first step 100 at least the first part of a computation task is computed by at least two of the plurality of computation nodes CN, each computation node CN interfacing a communication infrastructure IN. Furthermore, computing of at least a second part of the computation task in step 101 by at least one booster B is performed, each booster B interfacing the communication infrastructure IN) **and wherein the application manager receives the information and processes it as input to the resource manager** (paragraph [0097]: For doing so the resource manager RM may access the assignment metric, which may be stored in a database DB or any kind of data source. The resource manager RM is arranged to update the assignment metric, which can be performed under usage of a database management system. The database DB can be implemented as any kind of storage. It may for instance be implemented as a table, a register or a cache) **such that the resource manager dynamically alters further distribution during the computing of the computation task** (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the

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computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

Regarding claim 4, Lippert discloses

wherein the resource manager (paragraph [0097]: the resource manager RM is arranged to evaluate the resource capacities of the booster B and performs the assignment, which means the selection of the booster B, as a function of the evaluated resource capacities of each of the boosters B) **receives the information such that the resource manager dynamically alters assignment of the computation nodes and booster nodes to each other during the computation of the computation task** (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may

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use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

Regarding claim 5, Lippert discloses

wherein daemons operate in the computation nodes and the booster nodes

(paragraph [0036]: a computer program being configured for accomplishing the introduced method; paragraph [0069]: For communication between boosters and computation nodes an application programming interface, also referred to as API, can be provided. The boosters B may be controlled transparently by the computation nodes through the respective API function calls) **to generate the information** (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

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Regarding claim 6, Lippert discloses

wherein the first distribution is determined based on a rating provided in source code for each sub-task (paragraph [0084]: the distinction between highly scalable and complex is made on the level of code blocks, and we introduce the notions Exascale Code Blocks (ECB) and complex Code Blocks (CCB); paragraph [0085]: For such problems, where a decent balance between ECBs and CCBs is given in terms of the relative amounts of memory (i.e., the degrees of freedom handled in of the relative amounts of memory, i.e., the degrees of freedom handled in of ECB vs. the CCB), execution times and data to be exchanged, it suggests itself to adapt to this situation by means of a specific architectural solution. The solution consisting of a traditional cluster computer approach along with an Exascale booster with tightly connected boosters and being connected with a cluster through the cluster's network. This dualistic approach has the potential to widen the anticipated narrow application field of pure Exascale systems substantially; paragraph [0086]: A coarse-grained architectural model emerges, where the highly scalable parts or ECBs of an application code are executed on a parallel many-core architecture, which is accessed dynamically, while the CCBs are executed on a traditional cluster system suitable dimensioned, including the connectivity along with a refined dynamical resource allocation system).

Regarding claim 7, Lippert discloses

wherein the information is used to provide a grouping of sub-tasks in at least one of the first and second iterations (paragraph [0091]: at least one booster B

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to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

Regarding claim 8, Lippert discloses

wherein a daemon (paragraph [0036]: a computer program being configured for accomplishing the introduced method; paragraph [0069]: For communication between boosters and computation nodes an application programming interface, also referred to as API, can be provided. The boosters B may be controlled transparently by the computation nodes through the respective API function calls) **operating at a node generates a measure of a loading of the node during processing of a sub-task** (paragraph [0017]: The assignment metric may be managed by a resource manager. Managing the assignment metric refers to establishing and updating rules naming at

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least one booster, which is assigned to at least one further named computation node.

Hence, it is possible to update the assignment metric at runtime. Such assignment rules may be created as a function of a load balancing, which detects workload of the computer cluster arrangement, especially of the boosters).

Regarding claim 9, Lippert discloses

A heterogeneous computing system comprising a plurality of computation nodes and a plurality of booster nodes (Fig. 2, paragraph [0067]: FIG. 2 shows a computer cluster arrangement comprising a cluster C as well as a booster group BG. The cluster comprises in the present embodiment four computation nodes, also referred as CN, as well as three boosters, also referred to as B) **for computing one or more tasks comprising multiple sub-tasks** (paragraph [0091]: In a first step 100 at least the first part of a computation task is computed by at least two of the plurality of computation nodes CN, each computation node CN interfacing a communication infrastructure IN. Furthermore, computing of at least a second part of the computation task in step 101 by at least one booster B is performed, each booster B interfacing the communication infrastructure IN), **a communication interface connecting the computation nodes with each other and the booster nodes** (Fig. 2, 3, 8 IN), **wherein the system comprises a resource manager for assigning booster nodes and computation nodes to each other for the computing of the tasks** (paragraph [0097]: the resource manager RM is arranged to evaluate the resource capacities of the booster B and performs the assignment, which means the selection of the booster B, as a function of the evaluated resource capacities of each of the boosters B) **and wherein**

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the system further comprises an application manager, the application manager being arranged to receive information from daemons operating in the computation nodes and booster nodes to update (paragraph [0097]: For doing so the resource manager RM may access the assignment metric, which may be stored in a database DB or any kind of data source. The resource manager RM is arranged to update the assignment metric, which can be performed under usage of a database management system. The database DB can be implemented as any kind of storage. It may for instance be implemented as a table, a register or a cache) **a distribution of the sub-tasks between the computation nodes and the booster nodes for a further computing iteration** (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

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Regarding claim 10, Lippert discloses

wherein the resource manager receives the information (paragraph [0097]:

For doing so the resource manager RM may access the assignment metric, which may be stored in a database DB or any kind of data source. The resource manager RM is arranged to update the assignment metric, which can be performed under usage of a database management system. The database DB can be implemented as any kind of storage. It may for instance be implemented as a table, a register or a cache) **such that the resource manager dynamically alters assignment of the computation nodes and booster nodes to each other** (paragraph [0091]: at least one booster B to one of the plurality of computation nodes CN in step 102 by a resource manager RM, for computation of the second part of the computation task is performed. As the right arrow in FIG. 4 indicates the control flow may point back to step 100. After assigning at least one booster B to at least one of the plurality of computation nodes CN in step 102 the assignment can be communicated to a computation node CN, which uses the transmitted assignment in further outsourcing steps. Hence, computing at least a second part of the computation task is performed in step 101 as a function of the assignment step 102; paragraph [0093]: Step 102 may comprise sub steps such as returning the computed at least second part of the computation task back to the computation node CN. Hence, the booster B returns the computed result back to the computation nodes CN. The computation nodes CN may use the returned value for computation of further computation tasks and may again forward at least a further part of a computation task to at least one of the boosters B).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SISLEY KIM whose telephone number is (571)270-7832. The examiner can normally be reached on 9:30 A.M - 6:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emerson Puente can be reached on (571)272-3652. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SISLEY N KIM/
Primary Examiner, Art Unit 2196
4/8/2022

3257

<i>Notice of References Cited</i>	Application/Control No. 16/963,749		Applicant(s)/Patent Under Reexamination Lippert et al.	
	Examiner SISLEY N KIM		Art Unit 2196	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20130282787-A1	10-2013	Lippert; Thomas	H04L29/08081	709/201
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 16/963,749		Filing Date 07/21/2020		<input type="checkbox"/> To be Mailed					
ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO													
APPLICATION AS FILED - PART I													
		(Column 1)	(Column 2)										
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)						
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A								
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A								
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A								
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$50 =									
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$230 =									
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))													
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL								
APPLICATION AS AMENDED - PART II													
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT	07/22/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)				
	Total (37 CFR 1.16(i))	* 10	Minus	** 20	= 0		x \$50 =		0				
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x \$240 =		0				
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE		0				
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)				
	Total (37 CFR 1.16(i))	*	Minus	**	=		x \$0 =						
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x \$0 =						
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.							LIE						
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".							/LAVINIA D JOHNSON/						
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".													
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.													

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Docket No.: 29959/55804
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Thomas Lippert et al.

Application No.: 16/963,749

Confirmation No.: 6322

Filed: July 21, 2020

Art Unit: 2196

For: APPLICATION RUNTIME DETERMINED
DYNAMICAL ALLOCATION OF
HETEROGENEOUS COMPUTE RESOURCES

Examiner: D. G. Muller

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated April 22, 2022, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

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Amendment dated July 22, 2022
Reply to Office Action of April 22, 2022

Docket No.: 29959/55804

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of operating a heterogeneous computing system comprising a plurality of computation nodes and a plurality of booster nodes, at least one of the plurality of computation nodes and a plurality of booster nodes being arranged to compute a computation task, the computation task comprising a plurality of sub-tasks, wherein the method comprising:

in a first computing iteration, assigning and processing the plurality of sub-tasks ~~are assigned to and processed~~ by ~~[[ones]]~~ at least a portion of the plurality of computation nodes and at least a portion of the plurality of booster nodes in a first distribution; and

generating, using information relating to the processing of the plurality of sub-tasks by at least the portion of the plurality of computation nodes and at least the portion of the plurality of booster nodes ~~is used to generate~~, a further distribution of the plurality of sub-tasks between the plurality of computation nodes and the plurality of booster ~~[[node]]~~ nodes for processing thereby in a further computing iteration.

2. (Original) The method according to claim 1, wherein an application manager receives the information and determines the further distribution.

3. (Currently Amended) The method according to claim 2, wherein a resource manager determines the assignment of ~~tasks and the plurality of~~ sub-tasks to the plurality of computation nodes and the plurality of booster nodes for the first computing iteration as a function of the computation task and wherein the application manager receives the information and processes ~~[[it]]~~ the information as input to the resource manager such that the resource manager dynamically alters further distribution during the computing of the computation task.

4. (Currently Amended) The method according to claim ~~[[1]]~~ 3, wherein the resource manager receives the information such that the resource manager dynamically alters assignment of the plurality of computation nodes and the plurality of booster nodes to each other during the computation of the computation task.

5. (Currently Amended) The method according to claim 1, wherein daemons operate in the plurality of computation nodes and the plurality of booster nodes to generate the information.

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6. (Currently Amended) The method according to claim 1, wherein the first distribution is determined based on a rating provided in source code for each sub-task in the plurality of sub-tasks.

7. (Currently Amended) The method according to claim 1, wherein the information is used to provide a grouping of sub-tasks in at least one of the first computing iteration and ~~second iterations~~ the further computing iteration.

8. (Currently Amended) The method according to claim 3, wherein a daemon operating at a node generates a measure of a loading of the node during processing of a sub-task of the plurality of sub-tasks.

9. (Currently Amended) A heterogeneous computing system comprising:

a plurality of computation nodes and a plurality of booster nodes for computing one or more tasks comprising multiple sub-tasks~~[[.]]~~;

a communication interface connecting the plurality of computation nodes with each other and the plurality of booster nodes, ~~wherein the system comprises~~;

a resource manager for assigning at least a portion of the plurality of booster nodes and at least a portion of the plurality of computation nodes to each other for the computing of the one or more tasks in a first computing iteration; and ~~wherein the system further comprises~~

an application manager, ~~the application manager being arranged~~ configured to receive information from daemons operating in at least the portion of the plurality of computation nodes and at least the portion of the plurality of booster nodes to update a distribution of the multiple sub-tasks between the plurality of computation nodes and the plurality of booster nodes ~~[[for]]~~ in a further computing iteration.

10. (Currently Amended) The heterogeneous computing system according to claim 9, wherein the resource manager receives the information such that the resource manager dynamically alters assignment of the plurality of computation nodes and the plurality of booster nodes to each other.

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REMARKS

By this Amendment, Applicant amends claims 1 and 3-10. Claims 1-10 are pending in the application.

From the Office Action (OA) dated April 22, 2022, claim 9 stands interpreted under 35 U.S.C § 112(f). Further, claims 1-10 stand rejected under 35 U.S.C § 102 as allegedly being anticipated by Lippert et al. (U.S. Publication No. 2013/0282787; hereinafter "Lippert"). In view of the foregoing amendments and the following remarks, reconsideration and allowance are respectfully requested.

Claim Interpretation

Claim 9 stands interpreted under 35 U.S.C. § 112(f). In particular, the OA asserts that the claim limitations "a plurality of computation nodes," "a plurality of booster nodes," "communication interface," "resource manager," and "application manager" are generic placeholders coupled with functional language without reciting sufficient structure to perform the received function and the generic placeholders are not preceded by a structural modifier.

Applicant respectfully disagrees with this interpretation and submits that the specification includes sufficient structural support for these claim limitations, for example in paragraphs [0013]-[0015] and [0021]-[0025].

Accordingly, Applicant respectfully submits that claim 9 should not be interpreted under 35 U.S.C. § 112(f).

Claim Rejection Under 35 U.S.C. §102

Claims 1-10 stand rejected under 35 U.S.C. 102 as allegedly being anticipated by Lippert. Applicants respectfully traverse the rejection because Lippert fails to disclose each and every element of these claims.

Claim 1 as amended recites a method of operating a heterogeneous computing system comprising a plurality of computation nodes and a plurality of booster nodes, comprising "in a first computing iteration, assigning and processing the plurality of sub-tasks by at least a portion of the plurality of computation nodes and at least a portion of the plurality of booster nodes in a first distribution," and "generating, using information relating to the processing of the plurality of sub-tasks by at least the portion of the plurality of computation nodes and at least the portion of the plurality of booster nodes, a further distribution of the plurality of sub-tasks between the plurality of computation nodes and the plurality of booster nodes for processing thereby in a further computing iteration." Amended

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claim 9 recites similar elements. Applicant respectfully submits that Lippert fails to disclose this combination of elements.

Lippert describes “a computer cluster arrangement and a method for operation of the introduced computer cluster arrangement” (see Abstract). In particular, Lippert discloses that the computer cluster arrangement solves “the parts of the computation task in parallel or in succession” (see paragraph [0016]). For example, a computation task may be divided into a first part and a second part and the second part may be computed parallel to the first part or subsequent to the first part. However, in contrast, amended claims 1 and 9 recite that the plurality of sub-task are processed in **multiple computing iterations**.

Additionally, paragraph [0020] of Lippert, which is cited in the OA, also fails to cure the missing disclosure of multiple computing iterations. In particular, paragraph [0020] of Lippert discloses a computation history used to empirically evaluate the response time of various boosters. For the sake of empirical evaluation and comparability of various boosters, the same computation task is computed on various boosters. In contrast to the recited limitations of amended claims 1 and 9, the computation history does not concern the present computation task, but instead concerns previous computation tasks which might be specially designed for testing purposes. Therefore, Lippert fails to disclose a plurality of sub-tasks of a specific computation task being computed in multiple computing iterations.

As depicted in FIG. 4 and described in paragraph [0091], instead of a task being computed in multiple computing iterations, Lippert describes a first part of a computation task that is computed by at least two of the plurality of computation nodes CN, and a second part of the computation task that is computed by at least one booster B. The “right arrow” in FIG. 4 identifies a returning of the results from the booster to the computation node for the computation node to use for computation of further computation tasks and optionally for forwarding at least a further part of a computation task to at least one of the boosters B (see paragraphs [0093] and [0094]).

Amended claims 1 and 9 are further distinguished over Lippert. In particular, paragraph [0017] of Lippert discloses updating an assignment metric at runtime “as a function of a **load balancing, which detects workload of the computer cluster arrangement**, especially of the boosters” (emphasis added). This merely indicates that the boosters are dynamically assigned to computation nodes based on the current workload. For such a load balancing, only the workload of the single boosters is required (i.e., information relating the **status of the computing nodes and the boosters**, but not information relating to the processing of the sub-tasks). In contrast, amended claims 1 and 9 allow for redistribution based on **information relating to the processing of the plurality of**

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sub-tasks, including adjusting the distribution of sub-tasks between computation nodes and boosters based on a scalability of the sub-task. The distribution may also be influenced by information learned about the processing of the sub-task and any need to call further sub-tasks during the processing (see, e.g., paragraph [0024] of the instant application). While amended claims 1 and 9 relate to analyzing the plurality of sub-tasks and obtaining information relating to the processing of the plurality of sub-tasks, Lippert merely proposes a load balancing based on the workload of the nodes.

For at least these reasons, Lippert fails to disclose the claimed combination “in a first computing iteration, assigning and processing the plurality of sub-tasks by at least a portion of the plurality of computation nodes and at least a portion of the plurality of booster nodes in a first distribution,” and “generating, using information relating to the processing of the plurality of sub-tasks by at least the portion of the plurality of computation nodes and at least the portion of the plurality of booster nodes, a further distribution of the plurality of sub-tasks between the plurality of computation nodes and the plurality of booster nodes for processing thereby in a further computing iteration,” as recited in amended claim 1 and as similarly recited in amended claim 9. Therefore, Lippert fails to anticipate amended claims 1 and 9.

Accordingly, Applicant respectfully submits that the rejection of amended claims 1 and 9 under 35 U.S.C. § 102 is overcome and requests that the rejection be withdrawn. Further, 2-8 and 10 depend from either claim 1 or 9. Therefore, the rejection of these claims should be withdrawn for at least the reasons mentioned above.

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CONCLUSION

In view of the above, Applicant submits the pending application is in condition for allowance and an early action so indicating is respectfully requested.

The Commissioner is authorized to charge any fee deficiency required by this paper, or credit any overpayment, to Deposit Account No. 13-2855, under Order No. 29959/55804, from which the undersigned is authorized to draw.

Dated: July 22, 2022

Respectfully submitted,

By ___/Matthew R. Carey/_____
Matthew R. Carey
Registration No.: 61,082
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Attorney for Applicant

Electronic Acknowledgement Receipt

EFS ID:	46251972
Application Number:	16963749
International Application Number:	
Confirmation Number:	6322
Title of Invention:	APPLICATION RUNTIME DETERMINED DYNAMICAL ALLOCATION OF HETEROGENEOUS COMPUTE RESOURCES
First Named Inventor/Applicant Name:	Thomas Lippert
Customer Number:	4743
Filer:	Matthew Richard Carey/Valeria Rodriguez
Filer Authorized By:	Matthew Richard Carey
Attorney Docket Number:	29959/55804
Receipt Date:	22-JUL-2022
Filing Date:	21-JUL-2020
Time Stamp:	13:54:46
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		29959_55804_Response_to_NF OA_dated_4-22-22.pdf	37941	yes	7
			d6edd19ecc7ba9a65f93e6532aff79c4c804cab		

	Document Description	Start	End
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Claims	2	3
	Applicant Arguments/Remarks Made in an Amendment	4	7

Warnings:

Information:

Total Files Size (in bytes):	37941
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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3268

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NOTICE OF ALLOWANCE AND FEE(S) DUE

4743 7590 09/01/2022
MARSHALL, GERSTEIN & BORUN LLP
233 SOUTH WACKER DRIVE
6300 WILLIS TOWER
CHICAGO, IL 60606-6357

EXAMINER

KIM, SISLEY NAHYUN

ART UNIT

PAPER NUMBER

2196

DATE MAILED: 09/01/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/963,749	07/21/2020	Thomas Lippert	29959/55804	6322

TITLE OF INVENTION: APPLICATION RUNTIME DETERMINED DYNAMICAL ALLOCATION OF HETEROGENEOUS COMPUTE RESOURCES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	12/01/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

4743 7590 09/01/2022
MARSHALL, GERSTEIN & BORUN LLP
233 SOUTH WACKER DRIVE
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CHICAGO, IL 60606-6357

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/963,749	07/21/2020	Thomas Lippert	29959/55804	6322

TITLE OF INVENTION: APPLICATION RUNTIME DETERMINED DYNAMICAL ALLOCATION OF HETEROGENEOUS COMPUTE RESOURCES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	12/01/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
KIM, SISLEY NAHYUN	2196	718-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/963,749	07/21/2020	Thomas Lippert	29959/55804	6322
4743	7590	09/01/2022	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP			KIM, SISLEY NAHYUN	
233 SOUTH WACKER DRIVE			ART UNIT	
6300 WILLIS TOWER			PAPER NUMBER	
CHICAGO, IL 60606-6357			2196	
DATE MAILED: 09/01/2022				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b) (2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/963,749	Applicant(s) Lippert et al.	
	Examiner SISLEY N KIM	Art Unit 2196	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/22/2022.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-10. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. <input type="checkbox"/> Notice of References Cited (PTO-892)	5. <input type="checkbox"/> Examiner's Amendment/Comment
2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. <input type="checkbox"/> Other _____.
4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/SISLEY N KIM/
Primary Examiner, Art Unit 2196

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Notice of Allowability

Reasons for Allowance

1. The following is an examiner's statement of reasons for allowance:

Applicant's amendment and arguments filed on July 22, 2022 have been fully considered and they are persuasive.

The combination of elements recited in the claims as amended is not taught or suggested by the prior art(s) of the record either alone or in combination. An updated search has been performed and no prior art has been found that teaches the combination of elements present in the claims. Thus, the claims are deemed allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SISLEY KIM whose telephone number is (571)270-7832. The examiner can normally be reached on Monday through Friday from 9:30 A.M - 6:30 P.M EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emerson Puente can be reached on (571)272-3652. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SISLEY N KIM/
Primary Examiner, Art Unit 2196
8/20/2022